Heritage Language Maintenance and Phonological Maintenance in Toronto Cantonese Monophthongs?

-- But They Still Have an "Accent"!

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Slides will be available at:
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HERITAGE LANGUAGE VARIATION AND CHANGE IN TORONTO
HTTP://PROJECTS.CHASS.UTORONTO.CA/NGN/HLVC

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UNIVERSITY OF TORONTO

Social Sciences and Humanities Research Council of Canada

Conseil de recherches en sciences humaines du Canada

My Research

Sound Change

How do the sound systems of a language change over time?

Heritage Language (HL) Phonology

What characterizes HL phonology? Is it even different?

Data from

HERITAGE LANGUAGE VARIATION AND CHANGE IN TORONTO

An under-researched area of HL speech (Rao 2016)

What inter-generational differences can we find in the vowel system of HL speakers?

Variationist Approach: Is there evidence for "change in progress" (Labov 1994) in intergenerational differences in vowel production?

This Presentation

- First glimpse of inter-generational variation across ALL eight Cantonese monophthongs
  - Extends earlier analyses based on fewer vowels (Tse 2015; 2016; In Press; Accepted)
- Specific Research Questions
  - Is there evidence of vowel mergers?
  - Is there evidence of inter-generational low-level phonetic differences?
    - Two possible sources
      - Vowel Shifts?
      - Changes in phonetic conditioning?

Heritage Languages (HL)

- In HLVC Project context:
  - "mother tongues other than Canada's two official languages (English and French)" (Nagy 2016:16)
- In my research:
  - Language spoken in diasporic context involving migration from "homeland" to "host country"
    - A social context with
      - Psycholinguistic implications (early bilingualism, early acquisition of two phonologically distinct languages) →
      - Implications for inter-generational change in usage patterns →
      - Implications for community-level change (contact-induced change)

Is HL Phonetics Different?

- "It is well known that bilingual speakers have different phonetic representations than do monolinguals (Caramazza et al. 1974; Bullock et al. 2004; Sundara et al. 2006), so the presence of a heritage 'accent' should not come as a total surprise." (Polinsky & Kagan 2007)
- Low-level phonetic differences in vowels supported by studies of
  - French (Mack 1990), Western Armenian (Godson 2004), Korean (Baker & Trofimovich 2005), Arabic (Saadah 2011), Mandarin (Chang et al. 2011, Yang 2014), Spanish (Ronquest 2013)
- May be motivated by maximizing both language-internal and cross-linguistic distinctions (Chang et al 2011)

Is HL Phonology Different?

- “heritage speakers generally sound so native like – one could easily imagine that there would be no differences in phonological representations between the heritage language and the baseline, although that remains to be shown.” (Polinsky & Kagan 2007)
- Studies of HL vowels cited in previous slide show lack of evidence for vowel mergers
  - Supports Polinsky & Kagan’s (2007) claim
- Does not consider change in phonetic conditioning
  - Changes in phonetic conditioning Toronto Heritage Polish devoicing (Lyskawa et al 2016) → evidence for phonological change

The Specifics of Toronto Cantonese

Homeland Cantonese

http://lmp.ucla.edu/profile.aspx?menu=004&langid=73

1960s - 1997

Toronto Heritage Cantonese

http://www.whereig.com/images/cities/toronto-location-map.jpg

- **1960s**: First large wave of immigration from Hong Kong (UK Colony ~90% Cantonese speakers) to Canada
- **1980s-1997**: More immigration, motivated by fears of handover to China
- **2011 Census**: 178,000+ (3.1%+ of population) Cantonese speakers in Toronto
  - 2nd most widely spoken language (after English)

Awareness of a Distinct Variety

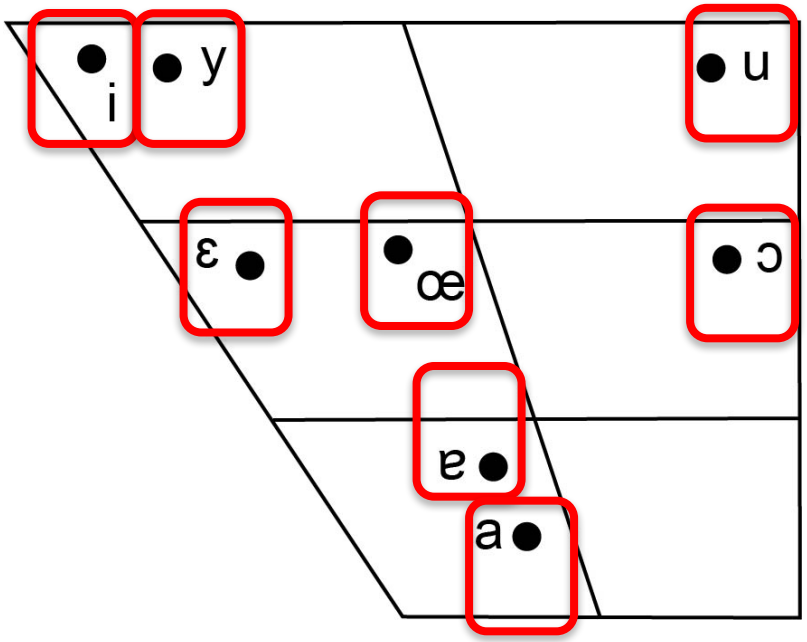
"what bothers me, is that it's not authentic Cantonese, but *canadian cantonese* [sic]"

"some of the accents are terrible, you can tell they're Canadian cantonese [sic] speakers"

Internet discussion board comments cited in Nagy (2016:21)

- But what phonetic/phonological features characterize this "accent"?
  - Vowels? Below the level of conscious awareness?

Cantonese Monophthong System



front		central	back
unround	round		round
i	y		u
ɛ	œ	ɐ	ɔ
		a	

Extensive description in Yue-Hashimoto (1972) and Bauer & Benedict (1998)

- 8 contrastive monophthongs
  - 7 out of 8 vowels included in previous analyses (Tse 2015, 2016, In Press, Accepted)
  - Unanalyzed vowel is /ɐ/

The Data

- HLVC (Heritage Language Variation and Change) Project Corpus (Nagy et al 2009, Nagy 2011)
  - For more info: http://projects.chass.utoronto.ca/ngn/HLVC
- Corpus consisting of
  - Digital recordings (.wav) of ~ 40+ speakers X 8 languages
  - For each speaker
    - hour-long sociolinguistic interviews (spontaneous speech sample)
    - Ethnic Orientation Questionnaire responses
    - picture naming task responses

Speakers Examined

- Sub-set of speakers (N = 20) from the HLVC Corpus
- Self-reported Cantonese proficiency level: adequate for hour-long spontaneous conversation
- English code-mixing and switching allowed (observed for all speakers)

GEN 1 Speakers (N = 10)

- Ages 46-82
- Born and raised in Hong Kong, came to Toronto as adults, AND have lived in Toronto for > 20 years
- Variable levels of English proficiency

GEN 2 Speakers (N = 10)

- Ages 16-44
- Grew up in Toronto, learned Cantonese primarily at home
- Preference for using English across most contexts (based on responses to Ethnic Orientation Questionnaire)

Token Distribution Per Speaker

- Whenever possible
  - Cantonese tokens selected from after the first 15 minutes of interview
  - F1 and F2 measurements recorded (based on Praat calculated averages for steady-state portions)
- For each vowel
  - 10 tokens in open syllable context, 5 tokens in velar context → 15 total
  - All Tone 1 (high level tone)

- Exceptions
  - Co-occurrence constraints
    - Ex: /ɐ/ does not occur in open syllable context →All tokens from closed syllable context
  - Low token frequency
    - first 15 minutes of interview, ethnic orientation questionnaire, and picture naming task recording also included
    - If still less than 15 tokens, other phonetic contexts also included

- 15 tokens X 8 vowels X 20 speakers X 2 formant measurements =
- GRAND TOTAL: **2400 vowel tokens (4800 formant measurements)**

Analysis Procedures

- All formant measurements normalized using Lobanov technique in NORM suite (Thomas and Kendall 2007)

Note: Step-up and Step-down match in all results reported, Best Step-down shown in all cases

Mixed Effects Modeling using R-brul (Johnson 2009) for each vowel category (or two vowel categories)

Dependent Variable

F1, F2

Independent Variables

Fixed Effects

For mergers: Vowel Category

For inter-generational vowel shifts: GEN

For phonetic conditioning: following consonant

Post-Hoc: preceding consonant

Random Effects

Speaker, Word

Mergers?

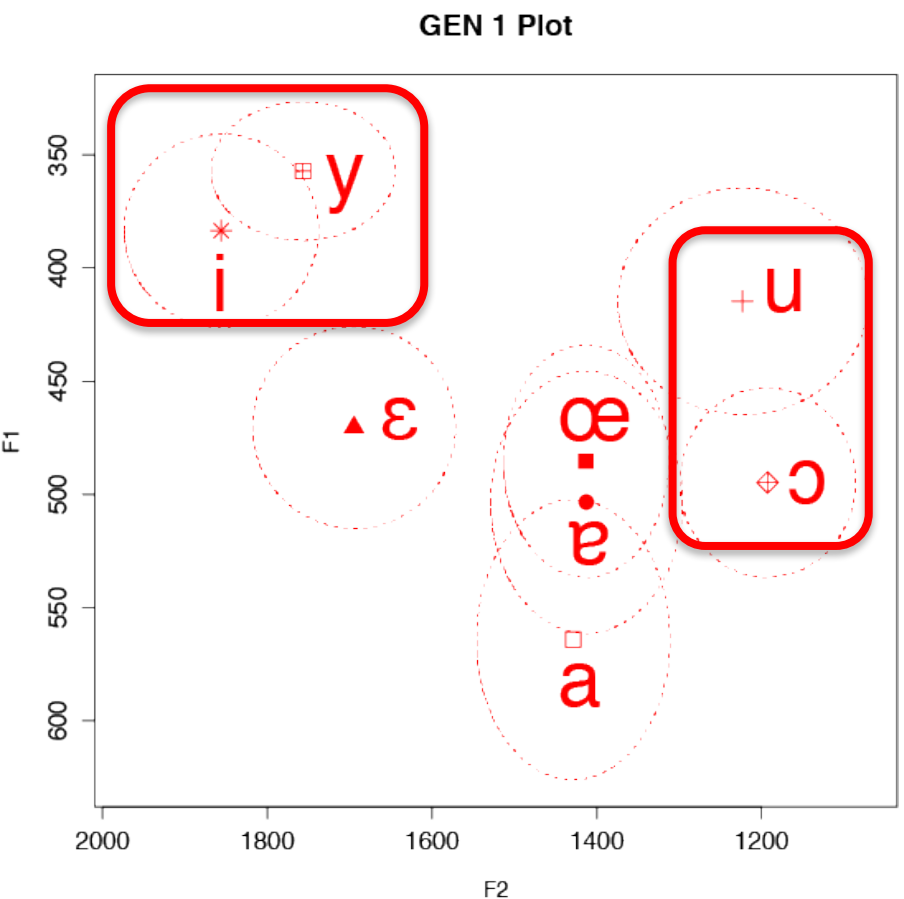
/i/ vs. /y/		
	GEN 1	GEN 2
F1	**	*
F2	**	***

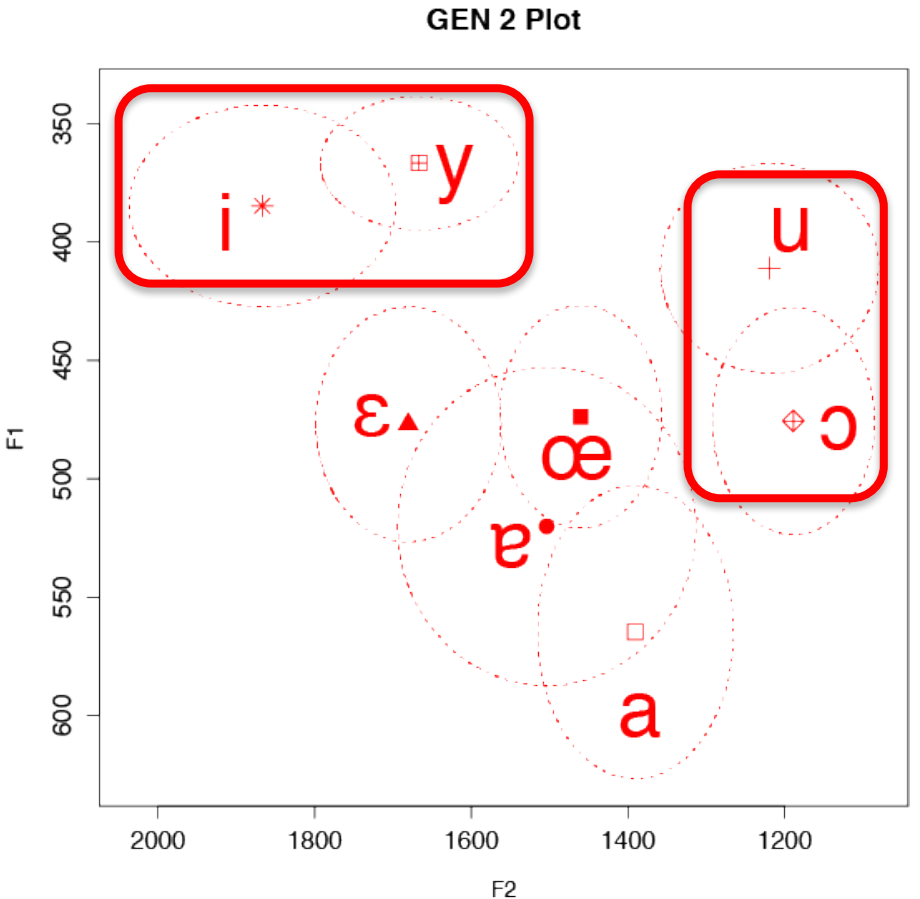
Distinct; No merger

Legend
n.s.
* < 0.05
** < 0.01
*** < 0.001

/u/ vs. /ɔ/		
	GEN 1	GEN 2
F1	***	***
F2	n.s.	n.s.

Distinct; No merger





Mergers?

GEN 1 Is /ɐ/ significantly different from:			
	/ɛ/	/œ/	/a/
F1	***	*	***
F2	***	n. s.	n. s.

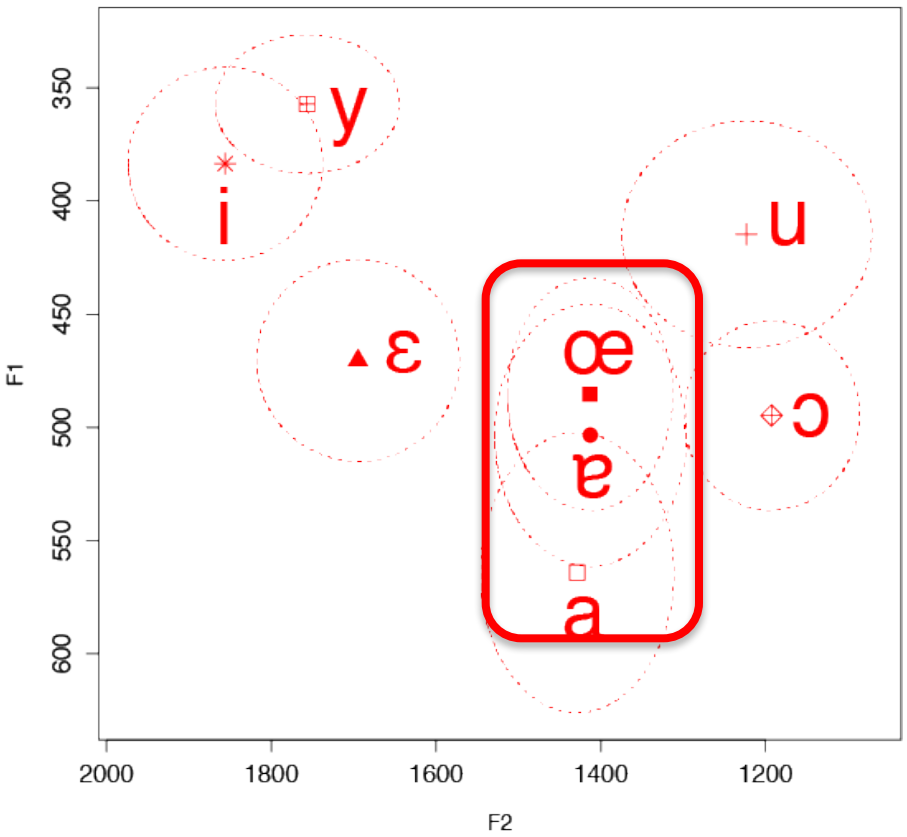
Distinct; no merger

Legend
n.s.
* < 0.05
** < 0.01
*** < 0.001

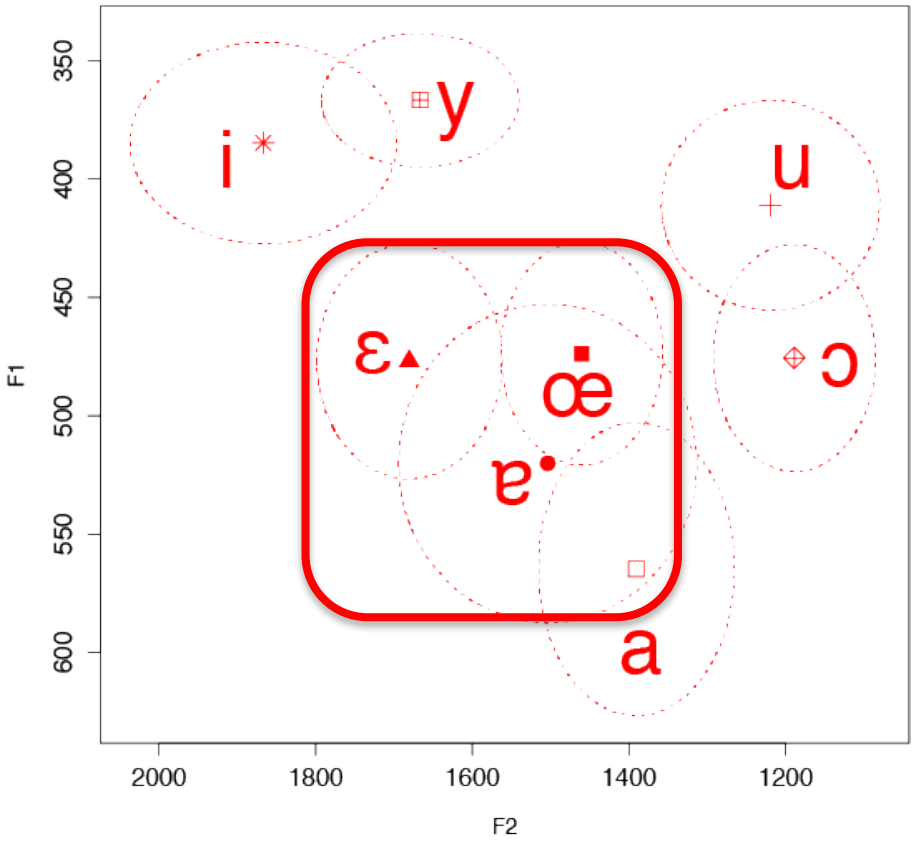
GEN 2 Is /ɐ/ significantly different from:			
	/ɛ/	/œ/	/a/
F1	***	***	***
F2	***	n.s.	***

Increasing /ɐ/ vs. /a/ distinction

GEN 1 Plot



GEN 2 Plot

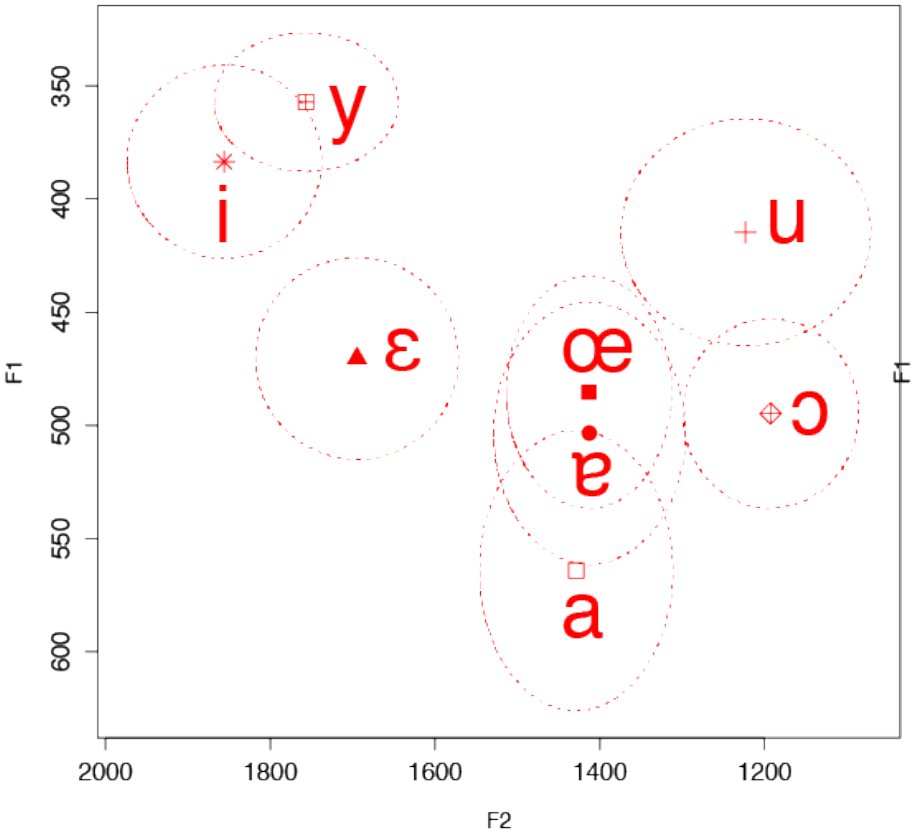


Vowel Shifts?

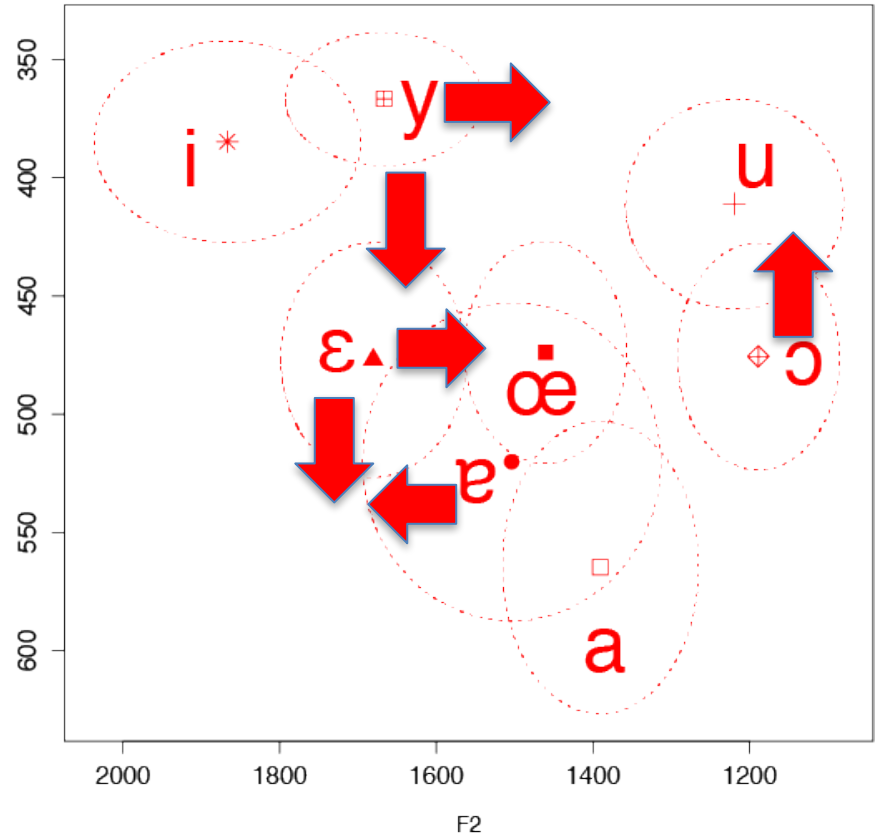
Legend
n.s.
* < 0.05
** < 0.01
*** < 0.001

Is GEN a significant predictor?								
	/i/	/y/	/u/	/ɛ/	/œ/	/ɔ/	/ɐ/	/a/
F1	n.s.	*	n.s.	*	n.s.	**	n.s.	n.s.
F2	n.s.	***	n.s.	*	n.s.	n.s.	*	n.s.

GEN 1 Plot



GEN 2 Plot



Changes in Phonetic Conditioning?

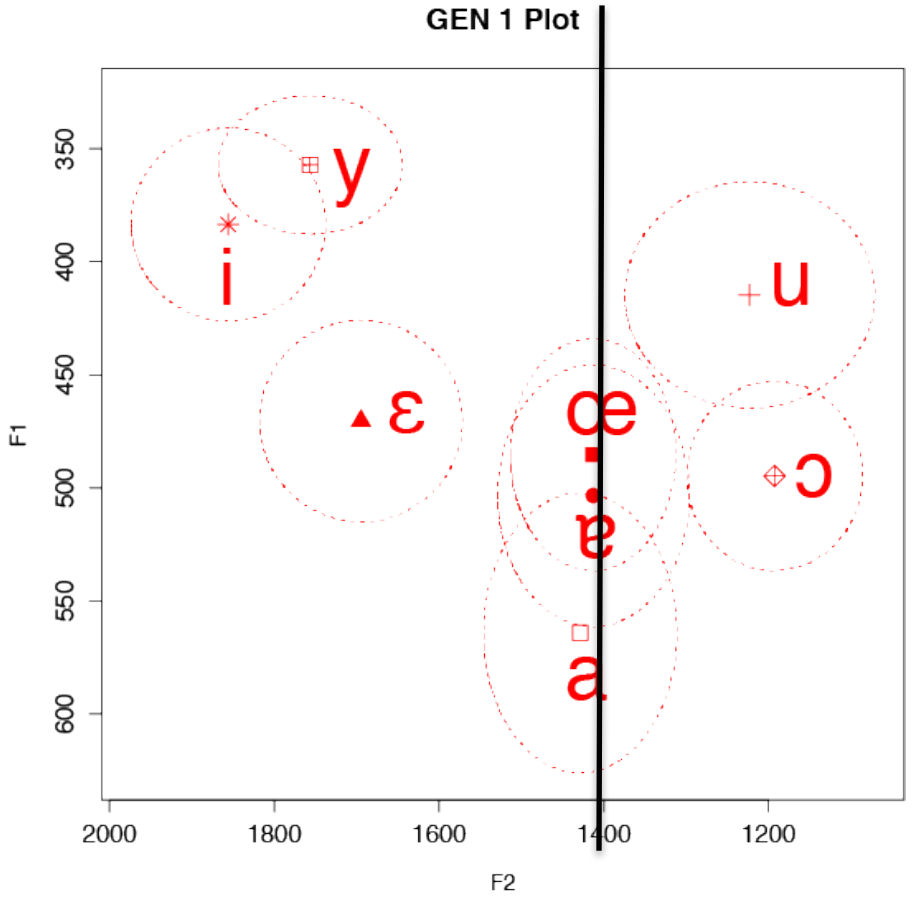
GEN 1 F2 of /ɐ/ r^2 [fixed] = 0.318, r^2 [random] = 0.139 r^2 [total] = 0.457 Preceding (p < 0.01)**			
	Coeff.	**N**	**Mean (Hz)**
/t͡sʰ/	82	36	1479
/t͡s/	74	10	1484
/t/	52	35	1450
/s/	23	9	1431
/kʰ/	-7	5	1411
/m/	-21	15	1366
/p/	-96	39	1317
/ŋ/	-108	1	1306

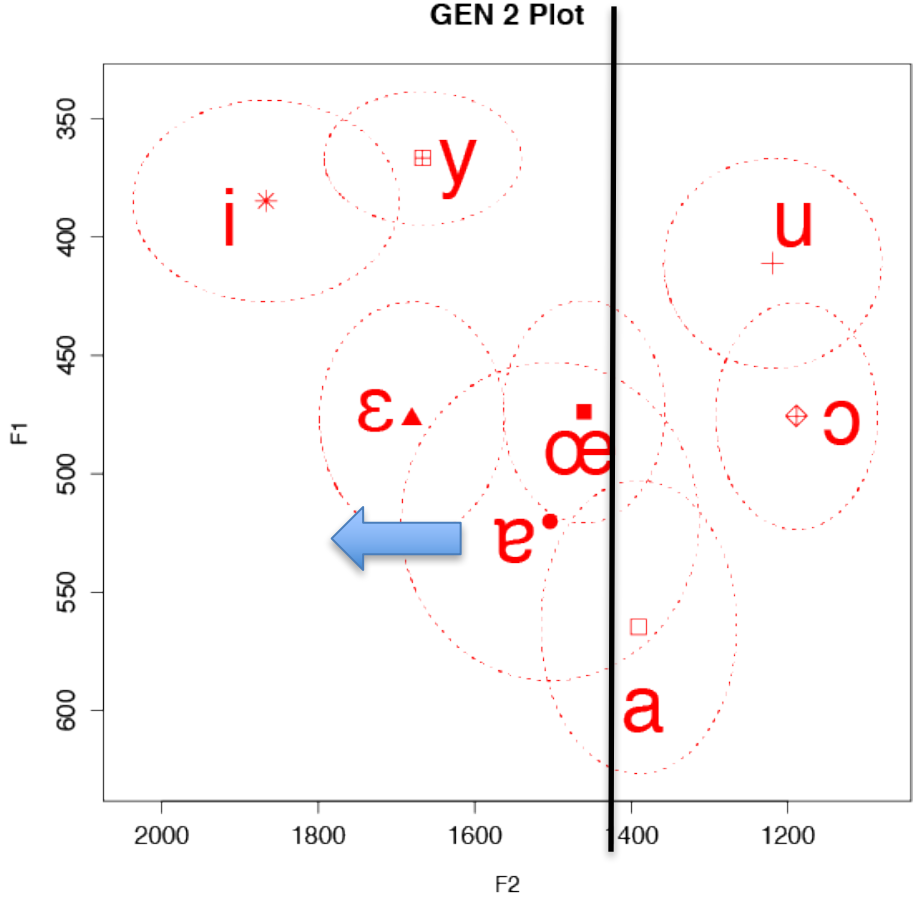
GEN 2 F2 of /ɐ/ r^2 [fixed] = 0.00, r^2 [random] = 0.243 r^2 [total] = 0.243 NO FIXED PREDICTORS		
	N	**Mean (Hz)**
/tsʰ/	17	1545
/t/	50	1541
/m/	18	1522
/s/	30	1508
/t͡s/	2	1441
/h/	1	1617
/p/	24	1427
/kʰ/	5	1343
/l/	2	1368

- All are coronal obstruents
- Coronal obstruents condition higher F2 among GEN 1
- BUT change in phonetic conditioning for GEN 2

More about /ɐ/

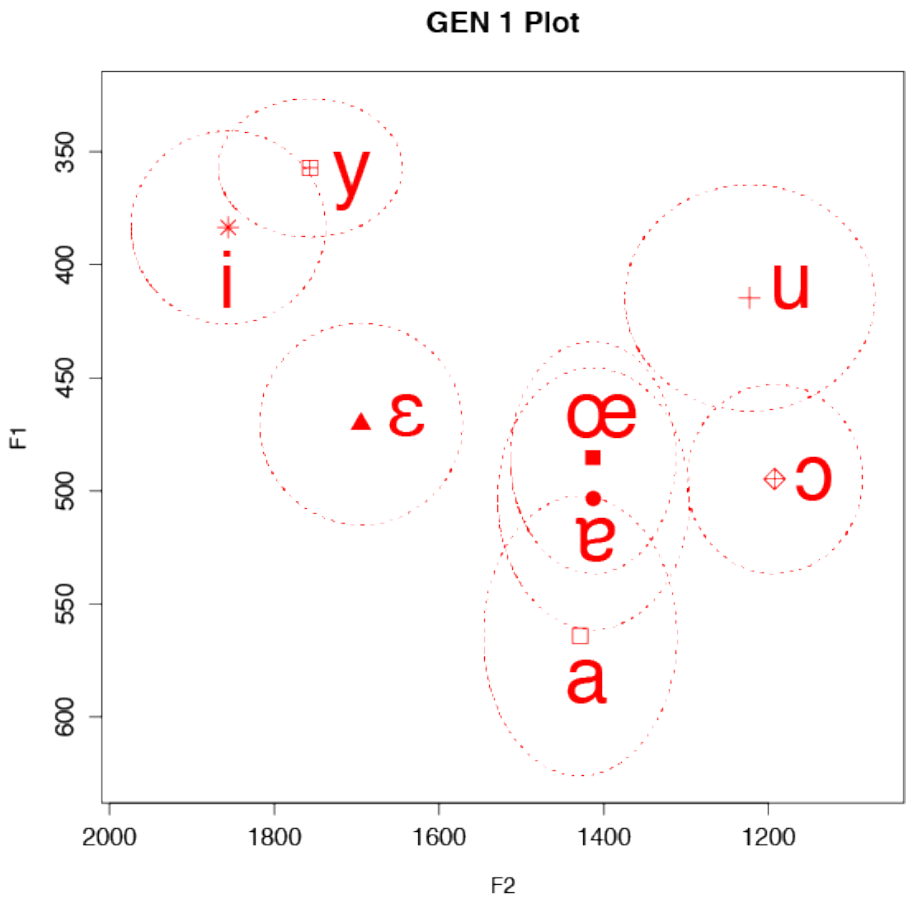
- For HK Cantonese, /ɐ/ vs. /a/ distinction described as primarily a length (quantity) contrast (cf. Bauer & Benedict 1998)
- But both F1 and F2 for /ɐ/ vs. /a/ distinct for GEN 2
- Also GEN 2 fronting of /ɐ/ AND stability of /a/
- Conclusion: /ɐ/ vs. /a/ distinction becoming primarily a vowel quality distinction among GEN 2 speakers

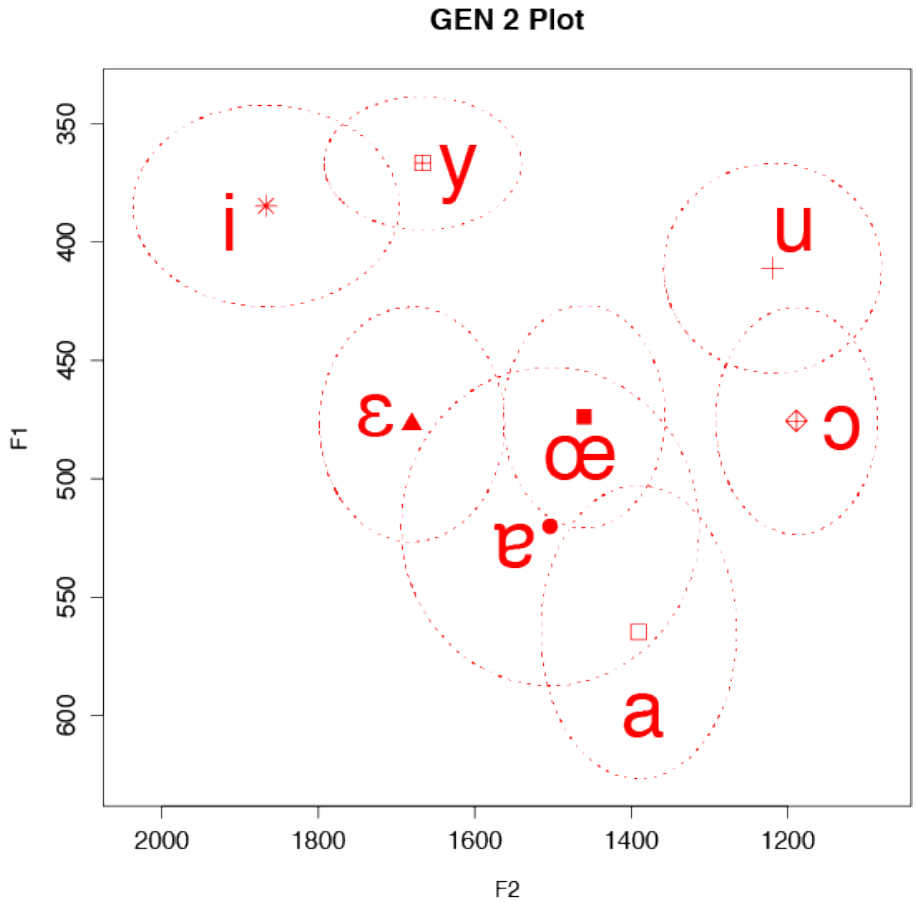




More about /ɐ/

- Greater standard deviation of F1/F2 means for GEN 2 speakers
- Loss of phonetic conditioning among GEN 2





Summary

1. Is there evidence of vowel mergers?
   - No, all 8 monophthong categories remain distinct for GEN 2 speakers
2. Is there evidence of inter-generational low-level phonetic differences?
   - Vowel shifts?
     - For /y/, /ɛ/, /ɔ/ and /ɐ/
   - Changes in phonetic conditioning?
     - Preceding coronal obstruents condition higher F2 for /ɐ/ among GEN 1 only

Conclusion

- “one could easily imagine that there would be no differences in phonological representations between the heritage language and the baseline” (Polinsky & Kagan 2007)
- If by “phonological representations”, we mean phonemic contrasts then yes
- BUT, Representations may also involve features (ex: lax vs. tense)
- Change from vowel quantity to quality distinction arguably a change in phonological representation
- also low-level phonetic differences may be influenced by different constraints (cf. Lyskawa et al 2016)→ evidence of phonological change → may have implications for long-term sound change

Next Steps

- Inter-generational comparison
  - Add more speakers and vowel tokens with the help of forced alignment (cf. Peters & Tse 2016)
  - Consider more phonetic contexts and lexical factors?
- Cross-community comparison
  - Is there evidence for the same changes in Hong Kong Cantonese? → Homeland data now available
  - To strengthen support for contact with Toronto English

감사합니다 Дякую Grazie molto Спасибо 多謝 gratsiə namuor:ə

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